

1. An apparatus for illuminating a rod comprising:
a plurality of light emitting diode chips, the light emitting diode chips forming at least one multi-chip package 110;
at least one reflector 120, the reflector 120 optically connected to the multi-chip package 110; and
an output rod 130, the output rod 130 optically connected to the reflector 120.
2. The apparatus of claim 1 wherein the reflector 120 directs light emanating from the light emitting diode chips.
3. The apparatus of claim 1 wherein the output rod 130 receives light emanating from the light emitting diode chips and light reflected by the reflector 120.
4. The apparatus of claim 1 wherein the output rod 130 is flexible.
5. The apparatus of claim 1 wherein the light emitting diode chips are positioned on the multi-chip package forming an array 260.
6. The apparatus of claim 1 wherein the maximum diameter of the multi-chip package 260 is equal to the input etendue of the output rod 130.
7. The apparatus of claim 1 wherein the reflector output aperture 245 is equal to the input diameter of the output rod 130.
8. The apparatus of claim 1 wherein the reflector 120 is a compound parabolic reflector 220.
9. The apparatus of claim 1 wherein the reflector 120 provides total internal reflection.
10. The apparatus of claim 1 further comprising:
a plurality of multi-chip packages 310 and a plurality of reflectors 310, the multi-chip packages 310 optically connected to the reflector 310; and

a dichroic cube 320, the dichroic cube 320 optically connected to the reflectors 310 and the output rod 330.

11. The apparatus of claim 10 wherein the plurality of multi-chip packages 310 emanate red, green, and blue light.
12. The apparatus of claim 10 wherein the dichroic cube 320 couples red, green, and blue light into the output rod 330 to generate white light.
13. A method for illuminating a rod comprising:
forming at least one multi-chip package from a plurality of light emitting diode chips;
transmitting light from the multi-chip package to at least one reflector; and
providing the light from the reflector to an output rod.
14. The method of claim 13 wherein the maximum etendue of the multi-chip package is equal than the input etendue of the output rod.
15. The method of claim 13 further comprising:
providing colored light from at least two multi-chip packages;
transmitting the colored light from the multi-chip packages to at least two reflectors;
providing the colored light from the reflectors to a dichroic cube;
generating a white light from the colored light as a function of the dichroic cube; and
providing the white light from the dichroic cube to the output rod.
16. The method of claim 15 wherein the colored light is directed by one reflector.
17. The method of claim 15 wherein the white light is generated from red, green, and blue light.
18. A system for illuminating a rod comprising:

means for forming at least one multi-chip package from a plurality of light emitting diode chips;

means for transmitting light from the multi-chip package to at least one reflector; and

means for providing the light from the reflector to an output rod.

19. The system of claim 18 further comprising:

means for providing colored light from at least two multi-chip packages;

means for transmitting the colored light from the multi-chip packages to at least two reflectors;

means for providing the colored light from the reflectors to a dichroic cube;

means for generating a white light from the colored light as a function of the dichroic cube; and

means for providing the white light from the dichroic cube to the output rod.